UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 27, 2018

MEMORANDUM TO: Samuel S. Lee, Chief
Licensing Branch 1
Division of Licensing, Siting,
and Environmental Analysis
Office of New Reactors

FROM: Getachew Tesfaye, Senior Project Manager ***/RA/***
Licensing Branch 1
Division of Licensing, Siting,
and Environmental Analysis
Office of New Reactors

SUBJECT: SUMMARY OF THE OCTOBER 25, 2018, CATEGORY 1 PUBLIC TELECONFERENCE TO DISCUSS THE NUSCALE POWER, LLC RESPONSES TO REQUESTS FOR ADDITIONAL INFORMATION ASSOCIATED WITH THE NUSCALE DESIGN CERTIFICATION APPLICATION

The U.S. Nuclear Regulatory Commission (NRC) held a Category 1 public teleconference on October 25, 2018, to discuss responses to the NRC staff's requests for additional information associated with the NuScale Power, LLC (NuScale) design certification application. Participants included personnel from NuScale, members the general public did not participate in this meeting.

The public meeting notice dated September 11, 2018, can be found in the NRC's Agencywide Documents Access and Management Systems under Accession No. ML18254A056. This meeting notice was also posted on the NRC public website.

Enclosed is the meeting agenda (Enclosure 1), list of participants (Enclosure 2), and overview (Enclosure 3).

Docket No. 52-048

Enclosures:
1. Meeting Agenda
2. List of Attendees
3. Meeting Overview

cc w/encl.: DC NuScale Power, LLC Listserv

CONTACT: Getachew Tesfaye NRO/DLSE
301-415-8013

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DATED: November 27, 2018

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OFFICE	DLSE/LB1:PM	DLSE /LB1:LA	DLSE/RPAC	DNRL/LB1:PM
NAME	GTesfaye	MMoore	RLavera*	GTesfaye (signed)
DATE	11/23/2018	11/26/2018	11/27/2018	11/27/2018

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U.S. NUCLEAR REGULATORY COMMISSION

CATEGORY 1 PUBLIC TELECONFERENCE TO DISCUSS THE NUSCALE POWER, LLC RESPONSES TO REQUESTS FOR ADDITIONAL INFORMATION ASSOCIATED WITH THE NUSCALE DESIGN CERTIFICATION APPLICATION

MEETING AGENDA

October 25, 2018

1:30 – 1:45 PM

Introductions and Identification of Topics

1:45 – 2:50 PM

Discussion of U.S. Nuclear Regulatory Commission Staff's Questions regarding NuScale Power LLC's Responses to Request for Additional Information (RAI) No. 9257 and Draft RAI No. 9607

2:50 – 3:00 PM

Public Comments/Questions

3:00 PM

Meeting Closure

U.S. NUCLEAR REGULATORY COMMISSION

CATEGORY 1 PUBLIC TELECONFERENCE TO DISCUSS THE NUSCALE POWER, LLC RESPONSES TO REQUESTS FOR ADDITIONAL INFORMATION ASSOCIATED WITH THE NUSCALE DESIGN CERTIFICATION APPLICATION

LIST OF ATTENDEES

October 25, 2018

Name	Organization
Getachew Tesfaye	U.S. Nuclear Regulatory Commission (NRC)
Zachary Gran	NRC
Ronald LaVera	NRC
Michael Dudek	NRC
Robert Taylor	NRC
Samuel Lee	NRC
Edward Stutzcage	NRC
Sean Meighan	NRC
Jim Osborn	NuScale Power, LLC (NuScale)
Jon Bristol	NuScale
Tom Bergman	NuScale
Mark Shaver	NuScale

U.S. NUCLEAR REGULATORY COMMISSION

OVERVIEW OF THE OCTOBER 25, 2018, TELECONFERENCE TO DISCUSS THE NUSCALE POWER, LLC RESPONSES TO REQUESTS FOR ADDITIONAL INFORMATION ASSOCIATED WITH THE NUSCALE DESIGN CERTIFICATION APPLICATION

The purpose of this teleconference was to discuss the results of the U.S. Nuclear Regulatory Commission (NRC) staff's review of NuScale Power LLC's (NuScale) response to Request for Additional Information (RAI) No. 9257 and the follow-up draft RAI No. 9607.

The following is the summary of the NRC staff's feedback and agreed upon next steps for the resolution of the remaining issues.

RAI No. 9257 and Follow-up Draft RAI No. 9607:

a. NRC Staff Feedback: NuScale's response to RAI No. 9257, Question 12.02-14, dated August 8, 2018 (Agencywide Documents Access and Management Systems (ADAMS) Accession No. ML18220B407), stated that the crud burst model used for the development of Design Control Document (DCD) Revision 0, Tier 2, was based on using relevant industry operating information as described in Electric Power Research Institute (EPRI) Technical Report 1011106, "Proceedings of the June 2004 EPRI PWR Primary Shutdown Workshop." This EPRI report utilized data from several large PWRs, including some with high duty core indexes, from which NuScale selected the highest reported values on which to base its model.

   The NRC staff reviewed the referenced EPRI report, and agrees that the crud burst factors, as derived from the information contained in the report, satisfies the staff concerns with respect to consideration of significant crud bursts related to a HDCI. The radioactive material contents for Chemical and Volume Control System (CVCS) demineralizers and filters contained in DCA Revision 1, Tier 2, were based on the expected accumulation of radioactive material (e.g., CVCS Mixed Bed Demineralizer 489 Ci of Co-58) resulting from a crud burst of a power adjusted magnitude consistent with the operating experience described in TR-1011106. Therefore, the NRC staff found the crud burst peaking factor assumptions provided in DCA Revision 1, Table 12.2-6, "Chemical and Volume Control System Component Source Term Inputs and Assumptions," to be acceptable.

   However, NuScale further stated in the same response to RAI No. 9257 that they had decided to remove the radionuclide activity from an assumed crud burst transient condition from the CVCS design basis evaluation because NuScale indicated that the crud burst assumption was unnecessarily conservative. Therefore, NuScale removed the crud burst peaking factor information from Table 12.2-6 and recalculated source terms without the assumed crud burst (this will subsequently lead to lower calculated dose rates). NuScale stated that instead of using the assumed crud burst peaking factor they will utilize the guidance of American National Standards Institute/American Nuclear Society (ANSI/ANS), Standard 18.1-1999, "Source Term Specification," for crud isotopes, as recommended in NuScale DSRS Section 11.1. NuScale also stated that the CVCS mixed bed demineralizers are assumed to collect radionuclide activity from the primary coolant during the operating

cycle and for a short post shutdown period, but with no additional radionuclide inventory from an assumed additional crud burst. NuScale stated that ANSI/ANS-18.1-1999 accounts for the crud burst.

The NRC staff stated that they had reviewed versions of ANSI/ANS 18.1 issued before and after the ANSI/ANS 18.1-1999, and other basis documents, including NUREG-CR-1992, "In-Plant Source Term Measurements at Four PWR's," to assess the applicability of ANSI-18.1 for evaluating the contributions from crud bursts on coolant radioactivity concentrations and the subsequent accumulation of radioactive material in systems such as the CVCS and Radioactive Waste systems. NUREG-CR-1992, Section 2.3, "Measurement Results," states that in all cases, only measurements obtained during non-spiking periods when the reactor power was 75 percent or higher were included in the averages. NUREG-CR-1992, Section 2.4, "Comparisons with Predictions," states that ANSI/ANS-18.1 provides typical radionuclide concentrations for use in estimating the average radioactivity in reactor coolant water. Therefore, based on the staff review of ANSI/ANS 18.1 and dthe associated basis documents, the staff believes that while ANSI/ANS-18.1 is a valid reference for estimating the coolant concentrations for routine normal releases from nuclear power plants, it is not appropriate for determining the coolant concentrations associated with shutdown crud bursts.

As a result of this change by NuScale the corrosion product inventory assumed in some of the CVCS system components (e.g., the Mixed Bed (MB) demineralizer) decreased significantly. For example, the Co-58 content of the CVCS Mixed Bed Demineralizer decreased from 489 Ci to 9.1 Ci. The reduction in corrosion products assumed to be present in the CVCS components significantly (non-conservatively) impacts the assumed dose rates from those components. Based on analysis performed by the NRC staff, the dose rate from the CVCS MB using NuScale's proposed source term is over a factor of 3 less than the dose rate from the CVCS MB source term with 0.066 percent Failed Fuel with a crud burst included. An additional analysis by the staff indicates that the dose rate from the CVCS MB from a crud burst only (no other activity in the CVCS MB) is over 2 times higher than the dose rate from the CVCS MB demineralizer using the isotopic concentrations provided in the response to RAI No. 9257.

In Draft RAI No. 9607, the NRC staff requested NuScale to provide a technical justification for why ANSI/ANS-18.1 accounts for anticipated radionuclide inventory associated with the expected post shutdown crud burst for a NuScale NPM. In its justification, NuScale should demonstrate why this assumption is reasonably conservative in predicting peak radiation source term in components, such as the CVCS Mixed Bed demineralizer, and how that affects the radiation zone near these components and to areas adjacent to these components.

b. During the meeting, NuScale reiterated its position that use of ANSI/ANS, Standard 18.1-1999, "Source Term Specification," is recommended in NRC's NuScale DSRS. NuScale also pointed to the fact that data in ANSI/ANS Standard is a weighted average over the life of normal operation of the plant which they assume implicitly include post shutdown crud burst. However, NuScale acknowledge that it does not have documentation that shows crud burst data is included in the weighted average. The NRC staff's stated that, without documentation to support NuScale's assumption, its position as supported by NUREG-CR-1992 that normal operation, specified in the Standard, did not include the post shutdown crud burst data remainedunchanged. NuScale stated that the radiation fields associated with the resin transfers are transitory in nature, and the radiation protection program would

be used to limit access to the areas, so there was no need to describe the transitory radiation fields.

c. The staff noted that transitory radiation fields have been desribed in other designs, as well as the current NuScale application. The staff indicated that it was fundamental to identify the kinds and quantities of radioactive material involved to determine what is needed as the basis for undesigned radiation shielding. Then once the source term is developed, then you can design the radiation shielding and use the radiation protection program to establish the necessary radiation protection controls.

d. Next Step: The NRC staff took action to further investigate the issue to inform its decision on Draft RAI No. 9607.